SECTION 233313

DAMPERS

PART 1– GENERAL

101. EXTENT

This section addresses the requirements for HVAC control, balancing, fire, smoke, and combination smoke/fire dampers.

102. RELATED WORK SPECIFIED IN OTHER SECTIONS

102.1 Section 230500 - General Requirements for HVAC Systems

103. SYSTEM DESCRIPTION

103.1 Provide backdraft, balancing, control, fire, smoke, and combination fire smoke dampers as shown on the drawings, schedules, and datasheets.

104. REFERENCE DOCUMENTS

104.1 Related standards, specifications, manuals and/or other publications of nationally recognized organizations are referenced herein. Methods, equipment and materials shall comply with applicable or specified portions of referenced documents, in addition to Federal, State or Local Codes having jurisdiction.

104.2 References to these documents shall be to the issue date as adopted in IBC 2006. If the document is not referenced in IBC 2006, then the reference is to the latest issue date of the document together with the latest additions, addenda, amendments, supplements, etc., in effect on the date of contract award.

104.3 AMCA – Air Movement and Control Association:

500-D – Laboratory Methods of Testing Dampers for Rating.

104.4 NFPA – National Fire Protection Association:

a. 90A – Installation of Air Conditioning and Ventilating Systems.

b. 92A – Smoke-Control Systems.

c. 92B – Smoke Control Systems in Atria, Covered Malls, and Large Areas.

d. 101 – Life Safety Code.

104.5 UL – Underwriters Laboratory:

a. Standard 555 – Standard for Safety; Fire Dampers.

b. Standard 555S – Standard for Safety; Leakage Rated Dampers for Use in Smoke Control Systems.

105. SUBMITTALS

105.1 Submit documents for review in accordance with the submittal requirements of this Specification.

105.2 Submit damper schedule indicating:

a. Damper identification number.

b. Damper type.

c. Damper size.

d. Damper orientation.

e. Airflow.

f. Pressure rating.

g. Fire rating.

h. Smoke rating.

i. Leakage.

j. Pressure drop.

k. Actuator type.

l. Manufacturer.

m. Model number.

105.3 Submit manufacturer's product data:

a. Include leakage, pressure drop, and maximum pressure, fire rating, smoke rating data.

b. Indicate materials, construction, dimensions, and installation details.

106. GENERAL QUALITY CONTROL AND QUALITY ASSURANCE REQUIREMENTS

106.1 Dampers shall be tested, rated and labeled in accordance with the latest UL requirements.

106.2 Damper pressure drop ratings shall be based on tests and procedures performed in accordance with AMCA 500-D.

107. DEFINITIONS

107.1 Combination Fire and Smoke Damper – A device that meets both the fire damper and smoke damper requirements.

107.2 Fire Damper – A device, installed in an air distribution system, designed to close automatically upon detection of heat, to interrupt migratory airflow, and to restrict the passage of flame.

107.3 Smoke Damper – A device within an air-distribution system to control the movement of smoke.

108. DELIVERY, STORAGE AND HANDLING

108.1 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

108.2 Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.

108.3 Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

109. PROJECT/SITE CONDITIONS

109.1 Work shall be performed at the temperatures recommended by the product manufacturer.

110. MAINTENANCE

110.1 Stored items shall be protected from the weather, humidity and temperature variations, dirt and dust, or other contaminants. Proper protection and care of all material both before and during installation shall be the CONTRACTOR's responsibility. Replace any materials found to be damaged at the CONTRACTOR's expense.

PART 2 – PRODUCTS

201. ACCEPTABLE MANUFACTURERS

201.1 Fire, Smoke, and Combination Fire Smoke Dampers:

a. Air Balance.

b. Greenheck.

c. Ruskin.

201.2 Balancing, Backdraft, and Control Dampers:

a. American Warming & Ventilating.

b. Greenheck.

c. Ruskin.

202. COMPONENTS

202.1 Backdraft Dampers:

a. Damper frame shall be extruded aluminum or galvanized steel channel with front flange and rear flange. Bolts holes in one or both flanges.

b. Blades shall be extruded aluminum or galvanized steel with a blade width not to exceed 6 inches.

c. Bearings shall be corrosion-resistant, long-life, synthetic, formed as single piece with axles.

d. Blade seals shall be mechanically attached to blade edge.

e. Axles shall be corrosion-resistant, long-life, synthetic, locked to blade and formed as single piece with bearings.

f. Counterbalances: Adjustable zinc plated steel weights mechanically attached to blade enabling damper to operate over wide range of pressures.

g. Damper capacity shall be rated to withstand HVAC system operating conditions.

202.2 Rectangular Control and Balancing Dampers:

a. Damper frame shall be aluminum or galvanized steel channel with bolt holes in one or both flanges.

b. Damper blades shall be double-skin airfoil-shaped.

c. Blade width shall be 5 inches to 8 inches maximum.

d. Axles shall be minimum 1/2 inch diameter plated steel rod.

e. Bearings shall be stainless steel sleeve pressed into frame.

f. Linkage shall be located out of the air stream.

g. Damper shall be provided with blade and jamb seals.

h. Damper capacity shall be rated to withstand HVAC system operating conditions.

202.3 Round Control Dampers:

a. Frame shall be galvanized steel with roll formed beads at each end.

b. Blade shall be double skin, aluminum or galvanized steel.

c. Bearings shall be self-lubricating stainless steel sleeve, pressed into hole in frame.

d. Blade seals mechanically attached to blade edge.

e. Axle shall be minimum 1/2 inch diameter, full length, plated steel, mechanically attached to blade.

f. Damper capacity shall be rated to withstand HVAC system operating conditions.

202.4 Manual Balancing Dampers – Round:

a. Frame shall be roll formed, galvanized steel with beads at each end.

b. Blade shall be round single-piece, galvanized steel.

c. Bearings shall be self-lubricating stainless steel sleeve, pressed into hole in frame.

d. Axle shall be a minimum 3/8 inch square, plated steel, mechanically attached to blade.

e. Damper capacity shall be rated to withstand HVAC system operating conditions.

202.5 Curtain Type Static Fire Dampers:

a. Fire Rating: 1-1/2 or 3 hour Fire Damper in accordance with UL555.

b. Air Flow Rating: UL approved for dual directional air flow.

c. Blades: Curtain type, out of airstream. Spring or gravity closure upon fusible link or ETL release.

d. Temperature Release Device: Fusible link or ETL.

202.6 Curtain Type Dynamic Fire Dampers:

a. Fire Rating: 1-1/2 or 3 hour Fire Damper in accordance with UL555.

b. Air Flow Rating: UL approved for dual directional air flow.

c. Dynamic Closure Rating: Dampers shall be classified for dynamic closure to 2000 fpm and 4 inches w.g.

d. Blades: Curtain type, out of airstream. Spring or gravity closure upon fusible link or ETL release.

e. Temperature Release Device: Fusible link or ETL.

202.7 Multi-Blade Dynamic Fire Dampers:

a. Fire Rating: 1-1/2 or 3 hour Fire Damper in accordance with UL555.

b. Air Flow Rating: UL-approved for dual directional air flow.

c. Dynamic Closure Rating: Dampers shall be classified for dynamic closure to 2000 fpm and 4 inches w.g.

d. Blades: Airfoil-shaped, single-piece, spring closure upon fusible link or ETL release.

e. Bearings: Self-lubricating stainless steel sleeve, turning in extruded hole in frame.

f. Blade Seals: Galvanized steel for flame seal to 1,900°F. Mechanically attached to blade edge.

g. Linkage: Concealed in frame.

h. Axles: Minimum 1/2 inch diameter plated steel, hex-shaped, mechanically attached to blade.

i. Temperature Release Device: Fusible link or ETL.

202.8 Smoke Dampers:

a. Smoke Rating: Leakage Class I, II, or III Smoke Damper in accordance with UL555S.

b. Frame: Roll formed, galvanized steel hat-shaped channel, reinforced at corners.

c. Blades: Airfoil-shaped, single piece, double skin, maximum 6 inch width.

d. Bearings: Self-lubricating stainless steel sleeve, turning in extruded hole in frame.

e. Blade Seals: Inflatable silicone material to maintain smoke leakage rating to a minimum of 450°F mechanically attached to blade edge.

f. Jamb Seals: Stainless steel, flexible metal compression type.

g. Linkage: Concealed in frame.

h. Axles: Minimum 1/2 inch diameter plated steel, hex-shaped, mechanically attached to blade.

202.9 Combination Fire Smoke Dampers:

a. Fire Resistance Rating: 1-1/2 or 3 hour Fire Damper in accordance with UL555.

b. Smoke Rating: Leakage Class I, II, or III Smoke Damper in accordance with UL555S.

c. Frame: Roll formed, galvanized steel hat-shaped channel, reinforced at corners or U-channel type frame.

d. Blades: Airfoil-shaped, single piece, double skin.

e. Bearings: Self-lubricating, stainless steel sleeve, turning in extruded hole in frame.

f. Blade Seals: Material to maintain smoke leakage rating to a minimum of 450°F and galvanized steel for flame seal to 1,900 °F. Mechanically attached to blade edge.

g. Jamb Seals: Stainless steel, flexible metal compression type.

h. Linkage: Concealed in frame.

i. Axles: Minimum 1/2 inch diameter plated steel, hex-shaped, mechanically attached to blade.

j. Temperature Release Device: Heat-Actuated, Quick Detect.

202.10 Actuators:

a. Electric 120 V, 60 Hz, two-position, fail close.

b. Electric 120 V, 60 Hz, two-position, fail open.

c. Electric 120 V, 60 Hz, modulating, fail close.

d. Electric 120 V, 60 Hz, modulating, fail open.

203. SOURCE QUALITY CONTROL

203.1 Factory Tests: Factory cycle damper assemblies to assure proper operation.

203.2 Dynamic Fire Damper Capacity: Demonstrate damper capacity to close under HVAC system operating conditions in accordance with UL 555.

PART 3 – EXECUTION

301. EXAMINATION

Inspect areas to receive dampers. Notify the DISTRICT of conditions that would adversely affect the installation or subsequent utilization of the dampers. Do not proceed with installation until unsatisfactory conditions are corrected.

302. INSTALLATION

302.1 Install dampers at locations indicated on the drawings and in accordance with manufacturer's installation instructions.

302.2 Install dampers square and free from racking with blades running horizontally.

302.3 Do not compress or stretch damper frame into duct or opening.

302.4 Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jackshaft.

302.5 Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.

303. FIELD QUALITY CONTROL

303.1 Perform initial testing of the units in accordance with manufacturer's instructions.

303.2 Test the units in accordance with the requirements of Section 230593 - Testing, Adjusting, and Balancing for HVAC Equipment.

304. ADJUSTING AND CLEANING

304.1 Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction.

304.2 Properly lubricate bearings with oil or grease as recommended by the manufacturer.

305. PROTECTION

305.1 Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations.

306. RECORD DOCUMENTATION

306.1 Installation drawings shall be submitted. Drawings shall indicate overall physical features, dimensions, ratings, service requirements, equipment weights and layout and arrangement details.

END OF SECTION